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| 10/586,582 | 07/19/2006 | Masahiro Honda | DKU/040630 | 7390 |
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| GLOBAL IP COUNSELORS, LLP 1233 20TH STREET, NW, SUITE 700 WASHINGTON, DC 20036-2680 | | | BAUER, CASSEY D | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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|------------------------------|--------------------------------------|-------------------------------------|
| Office Action Summary | Application No. 10/586,582 | Applicant(s) HONDA ET AL. |
| | Examiner Cassey Bauer | Art Unit 4157 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If no period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 19 July 2006.

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-20 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 1-20 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on 19 July 2006 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement(s) (PTO-1449)
Paper No(s)/Mail Date 7/19/2006

4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____

5) Notice of Informal Patent Application

6) Other: _____

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. **Claims 1, 2, 5, 7, 11, 13, 15, 17 and 19** rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In reference to claims 1, 2, and 7, the claimed limitation of the heat source heat exchanger to, "be configured such that refrigerant flows in from below and out from above" is unclear as there is no reference position to determine the relationship of refrigerant to the heat exchanger. The claim is written in such a broad manner as to encompass refrigerant flowing into a room from below and out of the room from above. The limitation could also be interpreted to mean that the refrigerant flows in to the HSHX at any position on the HSHX as long as the refrigerant is below the heat exchanger at some point up stream and leaves the HSHX at any position as long as the circuit at some point down stream of the HSHX is above the HSHX's position in the system. For examining purposes the examiner is going to assume applicant intended the limitation to read, "a heat source heat exchanger configured such that refrigerant enters the heat source heat exchanger at a position on the lower portion of the heat source heat exchanger, and leaves the heat source heat exchanger from a position on the upper portion of the heat source heat exchanger."

In reference to claims 1 and 2, the claimed limitation of arranging the refrigerant circuit such that, "when the heat source heat exchanger functions as an evaporator, an oil recovery operation is conducted by causing the refrigerant discharged from the compression mechanism to be bypassed to the intake side of the compression mechanism via the first bypass circuit, causing the heat source heat exchanger to function as a condenser" is unclear because if every time the HSHX functioned as an evaporator the oil recovery function was conducted wherein the HSHX was caused to function as a condenser, the HSHX would always function as a condenser and the claimed invention would fail to operate as a heat pump. For examining purposes the examiner is going to assume applicant intended the limitation to read, "when the heat source heat exchanger functions as an evaporator, an oil recovery operation can be temporarily conducted by causing the refrigerant discharged from the compression mechanism to be bypassed to the intake side of the compression mechanism via the first bypass circuit, causing the heat source heat exchanger to temporarily function as a condenser."

In reference to claims 1 and 2, the claimed limitation of, "a bypass circuit selectively bypassing the refrigerant discharged from the compression mechanism to an intake side of the compression mechanism" is unclear because it cannot be determined if the bypass circuit conducts the refrigerant from the intake side of the compressor around the fluid discharged from the compressor (bypassing the discharged refrigerant) to a position somewhere upstream of the compressor, or

if the liquid discharged from the compressor is immediately conducted to the intake side of the compressor (bypassing the rest of the refrigerant circuit). For examining purposes the examiner is going to assume applicant intended the limitation to read, "a bypass circuit selectively conducting the refrigerant discharged from the compression mechanism to an intake side of the compression mechanism."

In reference to claims 5, 11, 13, 15, 17, and 19, the claimed limitation, "water supplied at a constant amount" is unclear because it cannot be determined what property of the water is held constant. The amount of thermal energy or the flow rate of the water flowing through the heat exchanger could be held constant. For examining purposes the examiner is going to assume applicant intended the limitation to read, "water supplied at a constant flow rate".

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 1-4 and 7-10** are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,046,323 in view of applicant's admitted prior art Japanese Patent S63-204074, herein referred to as applicant's admitted prior art 074.

In reference to claim 1, 7, and 8 Kuwahara in view of applicant's admitted prior art 074 discloses the claimed invention:

Kuwahara teaches an air conditioner comprising:

a refrigerant circuit including a compression mechanism, see Kuwahara figures 1-10 (1), HSHX, figures 1-10 (5), a plurality of utilization heat exchangers, figures 1-10 (C1, C2, C3), a liquid refrigerant pipe connecting the HSHX and the utilization heat exchangers (G1, G2, G3, W, etc.), and an expansion valve disposed in the liquid refrigerant pipe (6), the refrigerant circuit being configured for switching to cause the HSHX and the UHX to function separately as evaporators or condensers of the refrigerant, see Kuwahara column 9 lines 41-42 and column 11 lines 34-35;

a first bypass circuit (2b) selectively (4, pulse motor valve) bypassing the refrigerant discharged from the compression mechanism to an intake side of the compression mechanism, see figures 1-10; and

an oil returning circuit (3a) connecting a lower portion of the HSHX and the intake side of the compression mechanism, the refrigerant circuit, the first bypass circuit and the oil returning circuit being further operatively arranged with respect to one another such that when the HSHX is caused to function and operates as an evaporator, an oil recovery operation is conducted by causing the refrigerant discharged from the compression mechanism to be bypassed to the intake side of the compression mechanism via the first bypass circuit causing the HSHX to function as a condenser, and closing the expansion valve, the refrigerant being

discharged from the compression mechanism is caused to flow into HSHX, and refrigerating machine oil accumulating inside the HSHX is returned to the intake side of the compression mechanism via the oil returning circuit, see Kuwahara column 11 lines 55 through column 12 line 35 (defrost mode operation) .

Kuwahara fails to disclose wherein the HSHX is configured such that refrigerant flows in from below and flows out from above when the heat source heat exchanger functions as an evaporator of the refrigerant.

Applicants admitted prior art 074, teaches a heat exchanger configured such that refrigerant flows in from below and flows out from above when the heat source heat exchanger functions as an evaporator of the refrigerant. Since applicant discloses that such a configuration is conventional, page 1 lines 10-20, it would have been obvious to one having ordinary skill in the art to configure the HSHX as taught by Kuwahara such that refrigerant flows in from below and flows out from above when the heat source heat exchanger functions as an evaporator of the refrigerant in order to prevent refrigerating machine oil from accumulating inside the evaporator.

In reference to claim 2, Kuwahara in view of applicant's admitted prior art 074 discloses the claimed invention.

The subject matter of claim 2 is directed to essentially the same subject matter of claim 1, see rejection of claim 1 above, further comprising a heat source switch mechanism, see Kuwahara figures 1-10 (outdoor control section 50) configured to switch between a condensation operation switched state that

causes the HSHX to function as a condenser of the refrigerant discharged from the compression mechanism and an evaporation operation switched state that causes the HSHX to function as an evaporator of the refrigerant flowing through the liquid refrigerant pipe, see Kuwahara column 9 line 7 through column 10 line 60 where Kuwahara teaches the outdoor control section that controls the opening and closing of two way valve (10) and PMV 4 which switches the operation state of the air conditioner to perform heating or cooling functions and switching the HSHX to perform as either a condenser or an evaporator;

a high-pressure gas refrigerant pipe connected between an intake side of the compression mechanism and the heat source switch mechanism (G3, G2) and configured to branch the refrigerant discharged from the compression mechanism before the refrigerant flows into the heat source switch mechanism, see Kuwahara figures 1-10, a utilization switch mechanism, figures 1-10 (60) configured to switch between a cooling operation switched state that causes the HSHX to function as an evaporator of the refrigerant flowing through the liquid refrigerant pipe and a heating operation switched state that causes the HSHX to function as a condenser of the refrigerant flowing through the high- pressure gas refrigerant pipe, see Kuwahara column 7 lines 19- column 9 line 6 where Kuwahara teaches an operation mode section (60) which controls PMV 21, PMV 31 and PMV 41 to switch between the heating and cooling modes of the HSHX; and

a low-pressure gas refrigerant pipe that sends the refrigerant evaporated in the UHX to the intake side of the compression mechanism, see figures 1-10 (W);

Kuwahara in view of applicant's admitted prior art 074 fails to disclose a plurality of utilization switches. The utilization switch is an essential working part in that it selects the heating and cooling mode available to each individual utilization heat exchanger, therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the air conditioner taught by Kusahara and modified by applicant's admitted prior art 074 by adding a plurality of utilization switches since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art.

In reference to claims 3 and 9, Kuwahara in view of applicant's admitted prior art 074 discloses the claimed invention.

The air conditioner of claims 1 and 2 respectively, see rejection of claims 1 and 2 above, further comprising:

a second bypass circuit (3b) connected between the utilization heat exchangers (C1, C2, C3) and the expansion valve (6), configured to branch the refrigerant from the liquid refrigerant pipe and send the refrigerant to the intake side of the compression mechanism (1), and disposed in the liquid refrigerant pipe, see figures 1-10.

In reference to claims 4 and 10, Kuwahara in view of applicant's admitted prior art 074 discloses the claimed invention:

The air conditioner of claims 3 and 9 respectively, see rejection of claim 3 and 9 above, further comprising a receiver, see Kuwahara figures 1-10 (9), connected between the utilization heat exchangers and the expansion valve, see figures 1-10, and the second bypass circuit being disposed so as to send the refrigerant from an upper portion of the receiver to the intake side of the compression mechanism, see figures 1-10.

5. **Claims 5, 11, 13, 15, 17, and 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuwahara in view of applicant's admitted prior art 074 as applied to claims 1, 2, 4, 9, and 10 above, and further in view of Handbook of Air Conditioning and Refrigeration, Shan K. Wang (Wang).

In reference to claim 5, 11, 13, 15, 17, and 19, Kuwahara in view of applicant's admitted prior art 074 in further view of Wang discloses the claimed invention:

Kuwahara in view of applicant's admitted prior art 074 teach the air conditioner of claims 1, 2, 4, 9, and 10 respectively, see rejection of claims 1, 2, 4, 9 and 10 above, but fail to teach wherein the heat source heat exchanger configured to use, as a heat source, water supplied at a constant amount without relation to a control of a flow rate of the refrigerant flowing inside the HSHX.

Wang teaches a water-source heat pump for use as an air conditioning system, page 28.24 chapter 28. Wang further teaches that water source heat

pumps receive water with a constant flow rate dependent upon the temperature leaving the hot water heater or the cooling towers, page 28.30, thus the flow rate of the water is without relation to a control of a flow rate of the refrigerant flowing inside the HSHX. Since Wang teaches that water source heat pumps are common for supplying conditioned air to facilities it would have been obvious to one having ordinary skill in the art at the time the invention was made, to use water as a heat source in the air conditioning system as taught by Kuwahara and modified by applicant's admitted prior art 074 to supply a liquid heat exchange medium with more favorable heat transfer properties than air.

6. **Claims 6, 12, 14, 16, 18, and 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuwahara as applied to claims 1, 2, 3, 9, 4, and 10 above, and further in view of HVAC Systems and Components Handbook, Grimm et al. (Grimm).

In reference to claim 6, 12, 14, 16, 18, and 20, Kuwahara in view of applicant's admitted prior art 074 in further view of Grimm discloses the claimed invention:

Kuwahara in view of applicant's admitted prior art 074 teaches the air conditioner of claims 1, 2, 3, 9, 4, and 10 respectively, see rejection of claims 1, 2, 3, 9, 4, and 10 above, but fails to teach wherein the heat source heat exchanger includes a plate heat exchanger.

Grimm teaches that plate and frame heat exchangers are common in liquid to liquid applications, see Grimm page 5.10.10, therefore it would have been obvious to one having ordinary skill in the art at the time the invention was

made, to modify the air conditioner as taught by Kuwahara and modified by applicant's admitted prior art 074 by using a plate heat exchanger as taught by Grimm for the HSHX to obtain the design advantages of a more compact design and ease of assembly and disassembly as taught by Grimm page 5.10.10.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 5,526,649, Sada.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cassey Bauer whose telephone number is (571)270-7113. The examiner can normally be reached on Mon-Thurs: 7-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marvin Lateef can be reached on (571)272-5026. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/CDB/
/Zelalem Eshete/
Primary Examiner, Art Unit 3748